

## **STABLE TRANSPARENT PERFUMING EMULSION**

### **Cross-Reference to Related Applications**

This application is a continuation of International Application  
5 PCT/IB02/01964 filed May 29, 2002, the entire content of which is expressly  
incorporated herein by reference thereto.

### **Technical Field**

The present invention relates to the field of perfumery. It concerns more  
10 particularly an alcohol-free perfuming composition in the form of a fluid, transparent  
water-in-oil or oil-in-water emulsion. The emulsion of the invention is characterised by an  
outstanding stability, the densities of the respective oily and aqueous phases being  
particularly close to one another.

### **Background of the Invention**

Several criteria must be met in a well-formulated emulsion. Two of the most  
readily apparent requirements are that the emulsion possesses adequate physical and  
chemical stability.

First of all, chemical stability of the various components of the emulsion  
20 should receive a particular attention in perfumery, since the main materials used in  
perfuming compositions, namely perfuming ingredients, are well-known to be particularly  
difficult to stabilise in formulations such as emulsions (Cosmetics and Toiletries®  
Magazine, Vol. 109, pages 71-75, 1994). The stabilisation of formulations comprising  
high fragrance levels such as those concerned by the present invention constitutes  
25 therefore a specific and challenging problem, notably different from that of the  
stabilisation of a cosmetic emulsion, which comprises other kinds of components, the  
nature of which is generally dependent on the type of the final cosmetic product (typical  
active ingredients include natural or synthetic oils, hydrocarbons, halogenated carbons,  
esters of mineral acids, silicones). Furthermore, such cosmetic compositions contain very  
30 low amounts of perfuming ingredients.

On the other hand, an essential requirement sought in the formulation of an  
emulsion of any kind is the physical stability, without which the emulsion will soon revert  
back to separate bulk phases. One typical phenomenon associated with physical  
instability is constituted by the upward and downward movement of dispersed droplets

relative to the continuous phase, termed creaming or sedimentation respectively. The factors that influence the rate of sedimentation or creaming are the diameter of the suspended droplets, the viscosity of the suspending medium and the difference in densities between the dispersed phase and the dispersion medium.

5           The prior art discloses a first means to avoid this destabilisation phenomenon, consisting in reducing the particle size of the dispersed system, which contributes greatly toward overcoming or minimising creaming.

          Therefore, perfuming compositions in the form of microemulsions are known from the prior art. Microemulsions are liquid dispersions of water and oil that are made  
10 homogeneous, transparent and stable by the addition of relatively large amounts of a surfactant and a co-surfactant. While emulsions are unstable, microemulsions are stable and, therefore, they are formed spontaneously when oil, water, surfactants and co-surfactants are mixed together. Conversely, emulsions require input of considerable mechanical energy for their preparation. Furthermore, microemulsion droplets have a  
15 narrow droplet size distribution with a mean diameter range of approximately 5-50 nm. Consequently this type of formulation scatters little light and is therefore transparent or at least translucent, while emulsions have very broad droplet size distributions and, as the emulsion droplets are comparable in size or larger than the wavelength of visible light, they scatter it more or less strongly depending on the difference in refractive index  
20 between oil and water. Thus most emulsions are opaque. It appears therefore that emulsions and microemulsions constitute two distinct dispersed systems, of different nature for the reasons here-above mentioned.

          Now, for the purpose of the present invention, it is not desirable to incorporate an important amount of surfactant relative to the amount of perfuming ingredients, as this  
25 limits considerably the amount of fragrance that can be incorporated in the mixture. Therefore, a microemulsion does not constitute a suitable dispersed system for the present invention, which has to be in the form of an emulsion.

          Another known transparent dispersed system of this type is the nanoemulsion characterised by an average size of the oily phase droplets below ca. 30-75 nm. The  
30 droplets are small enough to make the emulsion translucent or partially transparent. Although these nanoemulsions present the advantage of needing lesser amount of surfactants than the microemulsions, they present nevertheless the disadvantage that their process of preparation is often difficult and delicate, and thus costly.

The other manner disclosed in the prior art to stabilise a conventional emulsion is the addition of a polymer to the dispersed phase. However, this solution presents the drawback of thickening said phase, thus increasing the viscosity of the emulsion such that it is no longer easily sprayable.

5 WO 00/33804, the entire content of which is hereby incorporated herein by reference and which describes a perfuming composition in the form of a transparent emulsion, already matches most of the criteria required for such an emulsion (transparency, fluidity). However, the emulsion described in that publication has now been improved in terms of physical stability, thanks to a novel solution to the physical  
10 stability problem described herein.

In fact, the invention now provides a transparent, fluid, water-in-oil or oil-in-water emulsion characterised by the fact that the densities of the respective continuous and dispersed phases have almost matching values. This solution to the well-known problem of physical instability, and more particularly of creaming and sedimentation,  
15 specifically adapted to a dispersed system of the emulsion type, has been achieved thanks to the presence of a specific additive in the oily phase of the emulsion, namely a volatile fluorinated oil having a density higher than 1.

This class of compounds has already been used in some kinds of emulsions. In particular, EP 1064929 discloses the use of such a volatile fluorinated oil in a cosmetic  
20 composition for attenuating skin deficiencies and for giving a matt skin appearance. The cosmetic composition there-disclosed is not only totally distinct, from a formulation point of view, from a perfuming composition, but also the fluorinated oil is used in this prior art for a technical effect consisting in modifying the skin appearance, thus an aim distinct from that achieved by the present invention, i.e. the stabilisation of an emulsion.

25 EP 1064989 also discloses a cosmetic emulsion comprising a volatile fluorinated oil. Once again, the latter is described as being useful for its topical properties in such cosmetic applications, providing compositions of easy application, as well as fresh and soft products. Moreover, this document specifies that the fluorinated oil is very difficult to stabilise and may provoke an instability phenomenon such as foaming,  
30 demixing and changes in viscosity, and that it has thus to be used in combination with a specific surfactant, able to stabilise the emulsion. According to the teaching of this document, a volatile fluorinated oil is thus very difficult to stabilise.

The present invention now seeks to resolve these deficiencies.

### **Summary of the Invention**

The present invention, in a totally unexpected manner considering the teaching of the prior art, discloses that a perfuming composition, in the form of an emulsion, can be advantageously stabilised by minimising the difference existing between the densities of the respective continuous and dispersed phases and that such an effect could be achieved by adding to the oily phase of the emulsion a volatile fluorinated oil having a density higher than one, without any need of combining that ingredient with a specific surfactant such as disclosed in EP 1064989. Together with the transparency, fluidity and stability requirements, the composition of the invention is also alcohol-free, which is an advantage henceforth sought in such formulations.

The present invention provides an alcohol free perfuming composition in the form of a transparent water-in-oil or oil-in-water emulsion having an outstanding stability. In this composition, the difference between the density of the oily phase and that of the aqueous phase is less than or equal to 0.007, and preferably is less than or equal to 0.005. These emulsions are advantageously particularly resistant to phenomena such as creaming and sedimentation and constitutes a novel, effective solution to the instability problems known in the prior art compositions.

### **Detailed Description of the Preferred Embodiments**

According to the invention, it has been established that a substance can be added to a perfuming composition which is an emulsion and provide the technical effect of bringing closer the densities of the respective phases of this emulsion. A volatile fluorinated oil having a density higher than 1 constitutes such a substance. Also, the invention provides a perfuming composition in the form of an emulsion, wherein the oily phase comprises a certain amount of a volatile fluorinated oil having a density higher than 1. And furthermore, the invention also concerns the use of that ingredient as a stabilisation agent in an emulsion.

The perfuming composition of the invention is in the form of a transparent water-in-oil or oil-in-water emulsion susceptible of being sprayed, comprising an aqueous phase and an oily phase containing at least 3% by weight of perfuming ingredients relative to the total weight of the composition, wherein the difference between the density of the oily phase and that of the aqueous phase is less than or equal to 0.007, preferably less than or equal to 0.005. This technical effect may be achieved when the oily phase contains a volatile fluorinated oil having a density higher than 1.

What is intended here by perfuming composition is a perfume vehicle, the main function of which is to impart, enhance or modify the odoriferous properties of a product.

5 In the case of an oil-in-water emulsion, the continuous phase is formed by water (aqueous phase) and the dispersed phase is formed by the oil (oily phase) which is essentially formed of perfuming ingredients. Conversely, the emulsion is a water-in-oil or inverse emulsion when the continuous phase is formed by the oil wherein the water is dispersed. The latter type of emulsion is preferred according to one embodiment of the invention.

10 As mentioned above, the emulsion according to the present invention meets a certain number of criteria required in the field of perfumery, for applications such as perfumes, eaux de toilette, or Colognes.

First of all, the composition of the invention is alcohol free. There is at present a demand for such types of compositions, particularly from consumers with  
15 sensitive skins or whose skins are often exposed to the sun.

Moreover, the composition of the invention is fluid, or in other words susceptible of being sprayed. In particular, its viscosity is lower than 10 Pa.s, independently of the nature of the emulsion.

Furthermore, the emulsion is transparent, a desirable quality in the field of  
20 perfumery. The transparency is achieved thanks to the addition to the perfuming compositions of ingredients capable of modifying the refractive indices of the two phases, so as to form a transparent emulsion. The particular solid or liquid ingredients used to act either on the oily or on the aqueous phase in order to achieve transparency are described in WO 00/33804, the entire content of which is expressly included by reference herein,  
25 namely as regards the citation of such ingredients. Also, the refractive index of a finished perfuming composition according to the invention has a value between ca. 1.40 and 1.44.

Now, besides all the mentioned criteria already met, the present invention brings an advantageous improvement to the known transparent emulsions. In fact, it has been discovered that the addition of a certain ingredient to the oily phase of the emulsion  
30 could significantly improve the physical stability of the emulsion, in particular with regard to the creaming and sedimentation problems. In particular, the addition of such an ingredient to the oily phase of the emulsion makes it possible to narrow the difference between the respective densities of the two phases, so as to bring it within the limit defined above, namely lower or equal to 0.007, or even 0.005 in the preferred

embodiments. The invention brings thus a novel solution to the known problem of physical stability, by providing means for acting on the relative densities of both phases.

It has been observed that in the context of this invention it is possible to use a certain number of substances or agents having the capacity of acting on the oily phase as  
5 desired and the choice of which depends on individual criteria that can be easily established by the skilled person for each composition. The above-mentioned agent which will be used to act on the oily phase must be soluble in the latter.

Preferably the agent is chosen with a density higher than 1. It has been discovered that the desired above-described technical effect could be advantageously  
10 achieved in particular by adding to the oily phase a volatile fluorinated oil having a density higher than 1. The technical effect obtained with this compound is particularly surprising considering that, amongst the prior art, EP 1064989 teaches the need to combine that ingredient with a particular surfactant in order to stabilise it in an emulsion.

Preferably, the fluorinated oil used according to the present invention is  
15 selected from the group consisting of hydrofluoroethers such as methoxynonafluorobutane or ethoxynonafluorobutane. In a particular embodiment the ingredient added to the oily phase of the emulsion is methoxynonafluorobutane. The volatile fluorinated oil may also be used in mixture with a less volatile fluorinated oil such as a perfluoroalcane. Perfluorodecaline is an example of a suitable perfluoroalcane  
20 for this purpose. The amount of fluorinated oil added to the oily phase is comprised between 5 and 50% by weight relative to the oily phase.

The emulsions of the invention can contain from 5 to 50% by weight, preferably from 10 to 35% by weight, of dispersed phase and from 50 to 95% by weight, preferably 65 to 90% by weight, of continuous phase. These values are relative to the total  
25 weight of the emulsion and are independent of the fact that the compositions of the invention are in the form of a water-in-oil or an oil-in-water emulsion.

The oily phase is essentially formed of perfuming ingredients. Typically it comprises from 15 to 60%, preferably from 20 to 50% by weight of perfuming ingredients. The aqueous phase comprises from 20 to 65% of water.

30 Optionally, the composition of the invention may further contain at least one surfactant. This surfactant will be used in a proportion of 0 to 8%, preferably 0.1 to 5% by weight, relative to the total weight of the emulsion. The best results were obtained using 2 to 5% by weight of surfactant.

Different types of surfactants can be used in the context of the invention. One can mention the non-ionic, cationic, anionic, amphoteric surfactants and the phospholipids, which may all be used in the present invention. Preferably, there is used a non-ionic surfactant or a mixture of two non-ionic surfactants. As non restrictive  
5 examples, the ethoxylated nonylphenol comprising 9 to 10 units of ethyleneglycol (on sale under the name of Triton<sup>®</sup> N-101 ; origin : Fluka, Switzerland) or the ethoxylated undecanol comprising 8 units of ethyleneglycol (on sale under the name of Imbentin<sup>®</sup> 0800 ; origin : Kolb AG, Switzerland) can be cited. Other examples include the surfactants known under the tradename Tween<sup>®</sup> (origin : ICI, England), such as  
10 Tween<sup>®</sup> 20 [polyoxyethylene (20) sorbitan monolaurate], Tween<sup>®</sup> 40 [polyoxyethylene (20) sorbitan monopalmitate], Tween<sup>®</sup> 60 [polyoxyethylene (20) sorbitan monostearate] and Tween<sup>®</sup> 80 [polyoxyethylene (20) sorbitan monooleate], and the surfactants commercialised under the name of Span<sup>®</sup> (origin : ICI, England), such as Span<sup>®</sup> 20 (sorbitan monolaurate), Span<sup>®</sup> 40 (sorbitan monopalmitate), Span<sup>®</sup> 60 (sorbitan  
15 monostearate), and Span<sup>®</sup> 80 (sorbitan monooleate). One can further mention Cremophor<sup>®</sup> RH40 and RH60 (origin : BASF AG, Germany, which are ethoxylated hydrogenated ricin oils), Genapol<sup>®</sup> [origin : Hoechst AG, Germany, a sodium (alcohol polyglycol ether) laurylsulfate], the surfactant known under the name of Poloxamer<sup>®</sup> 407 (a diblock copolymer of ethyleneoxyde and propyleneoxyde, also commercialised under  
20 the names of Pluronic<sup>®</sup> F 127 and Pluracare<sup>®</sup> F 127, origin : BASF AG, Germany) ; Tetronic<sup>®</sup> (origin : BASF AG, Germany) ; DC 3225 C, DC 5200, DC 193 (origin : Dow Corning, USA) ; Abil<sup>®</sup> Em 97 (origin : Goldschmidt).

The perfuming ingredients that can be used in the present invention are all the ingredients commonly used in perfumery. These ingredients shall not be described in  
25 greater detail here, as their description cannot be exhaustive and the skilled person is able to choose them using his general knowledge and as a function of the desired olfactory effect. These perfuming ingredients belong to a variety of chemical classes, as varied as alcohols, aldehydes, ketones, esters, ethers, acetates, nitriles, terpernic hydrocarbons, heterocyclic nitrogen- or sulfur- containing compounds, as well as essential oils of natural  
30 and synthetic origin. Many of these ingredients are furthermore described in reference textbooks such as the book of S. Arctander, Perfume and Flavour Chemicals, 1969, Montclair, New Jersey, USA, or its more recent versions, or other books of similar nature. The nature of the perfuming ingredients is not an essential parameter of the invention, and

the choice of the latter shall be solely dictated by hedonic requirements, i.e., as a function of the fragrance or odorant effect that it is desired.

The emulsion of the invention can be easily prepared by conventional mixing and homogenising methods, which therefore do not require a more detailed description herein. According to the present invention, emulsions are created with an average drop  
5 size above 200 nm, preferably below 1 µm.

### **Examples**

The invention will now be illustrated by the following non-restrictive  
10 examples, in which the temperatures are indicated in degrees Celsius, the proportions of the ingredients are given in % by weight and the abbreviations have the usual meaning in the art.

#### **Example 1**

15 Preparation of an alcohol-free perfuming composition in the form of a water-in-oil emulsion

A water-in-oil emulsion containing a perfuming base has been prepared with the below-  
20 specified ingredients. Incorporation of the fluorinated oil was done after emulsification of the other ingredients by a current method in the art.

	<u>Ingredients</u>	<u>Parts by weight</u>
	Perfuming base *	10.00
25	Silicon DC® 345 <sup>1)</sup>	43.00
	Methoxynonafluorobutane <sup>2)</sup>	15.00
	Water	16.45
	1,2-Butanediol	11.55
	Abil® Em 97 <sup>3)</sup>	<u>4.00</u>
30	Total	100.00

1) origin : Dow Corning

2) origin : 3M

3) origin : Goldschmidt

35



\* The perfuming base was obtained by mixing the following ingredients :

	<u>Ingredients</u>	<u>Parts by weight</u>
	Citronellyl acetate	3
	Geranyl acetate	9
5	Linalyl acetate	276
	10% * Aldehyde C10	3
	10% * Aldehyde C12	12
	Methyl anthranilate	16
	Bergamot essential oil	226
10	Cetalox <sup>® 1)</sup>	5
	Lemon essential oil	318
	Dihydromyrcenol <sup>2)</sup>	60
	Dipropyleneglycol	20
	10% * Elemi <sup>3)</sup>	20
15	Fleuria 41063 B <sup>4)</sup>	3
	Ethyl linalol	66
	10% * 3-(4-Methoxyphenyl)-2-methylpropanal <sup>4)</sup>	30
	Geraniol	6
	50% * Habanolide <sup>® 5)</sup>	130
20	Hedione <sup>® 6)</sup>	215
	Hedione <sup>®</sup> HC <sup>7)</sup>	72
	10% ** Indol	12
	Iso E Super <sup>8)</sup>	85
	Lavandin grosso essential oil	26
25	1% * Liffarome <sup>® 9)</sup>	20
	Linalol	40
	Sfuma madarin essential oil	5
	10% * Crinkled mint essential oil	30
	Bigarade Neroli essential oil	130
30	Portugal Florida orange essential oil	80
	Phenethylol	9
	Petitgrain essential oil	63
	Pipol	5

	Rosemary essential oil	16
	Terpineol	9
	Violet essential oil	50
	1% * Zestover <sup>10)</sup>	<u>30</u>
5	Total	2100

\* in dipropyleneglycol (DIPG)

\*\* in triethanolamine

- 1) 8,12-epoxy-13,14,15,16-tetranorlabdane ; origin : Firmenich SA, Geneva,  
10 Switzerland
- 2) origin : International Flavours and Fragrances, USA
- 3) 5-allyl-1,2,3-trimethoxybenzene ; origin : Calchauvet, Grasse, France
- 4) origin : Firmenich SA, Geneva, Switzerland
- 5) pentadecenolide ; origin : Firmenich SA, Geneva, Switzerland
- 15 6) Methyl dihydrojasmonate ; origin : Firmenich SA, Geneva, Switzerland
- 7) Methyl dihydrojasmonate with high content of isomer *cis* ; origin : Firmenich SA,  
Geneva, Switzerland
- 8) 1-(octahydro-2,3,8,8-tetramethyl-2-naphtalenyl)-1-ethanone ;  
origin : International Flavours and Fragrances, USA
- 20 9) 3-hexenyl methyl carbonate ; origin : International Flavours and Fragrances, USA
- 10) 2,4-dimethyl-3-cyclohexene-1-carbaldehyde

The density of each of the two phases of the composition was measured at 30° on a  
density meter (DMA 4500 ; Anton Paar). The density of the aqueous phase was 1.0209  
25 and that of the oily phase was 1.0249, thus forming a stable transparent emulsion.

Moreover, the respective refractive index of each phase was also measured and the  
difference between the two phases was of 0.0058.

## 30 Example 2

Preparation of an alcohol-free perfuming composition in the form of a water-in-oil  
emulsion

A water-in-oil emulsion containing a perfuming base has been prepared with the below-specified ingredients. Incorporation of the fluorinated oil was done after emulsification of the other ingredients by a current method in the art.

5	<u>Ingredients</u>	<u>Parts by weight</u>
	Perfuming base *	10.00
	Silicon DC® 345 <sup>1)</sup>	45.00
	Methoxynonafluorobutane <sup>2)</sup>	13.00
	Water	15.15
10	1,2-Butanediol	12.85
	Abil® Em 97 <sup>3)</sup>	<u>4.00</u>
	Total	100.00

1) origin : Dow Corning

15 2) origin : 3M

3) origin : Goldschmidt

\* The perfuming base was obtained by mixing the following ingredients :

20	<u>Ingredients</u>	<u>Parts by weight</u>
	Benzyl acetate	250
	Pipol acetate	70
	Styrallyl acetate	230
	Phenylacetic aldehyde	10
25	Ambrettolide ® <sup>1)</sup>	10
	Astroton	300
	Bergamot essential oil	1160
	β-Ionone	550
	Cassis essential oil	150
30	50% * Cetalo® <sup>2)</sup>	60
	Lemon essential oil	850
	Citronellol	210
	Damascenone	20

	4-Decanolide	20
	Dihydromyrcenol <sup>3)</sup>	440
	Dipropyleneglycol	20
	Ethyl linalol	720
5	7-Methyl-2H,4H-1,5-benzodioxepin-3-one <sup>4)</sup>	100
	Floralozone <sup>® 5)</sup>	50
	3-(4-Methoxyphenyl)-2-methylpropanal <sup>4)</sup>	170
	Fructose <sup>® 6)</sup>	100
	Galbex <sup>® 4)</sup>	50
10	$\gamma$ -Damascone	5
	Geranium essential oil	30
	Grapefruit essential oil	100
	Habanolide <sup>® 7)</sup>	1120
	Hedione <sup>® 8)</sup>	2890
15	Hedione <sup>®</sup> HC <sup>9)</sup>	950
	Heliopropanal <sup>10)</sup>	400
	Indol	35
	Iso E Super <sup>11)</sup>	380
	Lavender grosso essential oil	40
20	Liffarome <sup>® 12)</sup>	1
	Lilial <sup>® 13)</sup>	1050
	Lyrar <sup>® 14)</sup>	430
	Sfuma mandarin essential oil	270
	Melonal <sup>15)</sup>	3
25	Crinkled mint essential oil	20
	Peony 434017 <sup>4)</sup>	60
	Peony white HS 100001 <sup>4)</sup>	200
	Phenethylol	80
	Phenylhexanol	50
30	Pipol	20
	Orange essential oil	500
	Rosalva <sup>16)</sup>	4
	Benzyl salicylate	400
	Pipol salicylate	400

10% ** BHT <sup>17)</sup>	200
Zestover <sup>18)</sup>	<u>22</u>
Total	15200

- 5     \*     in 2-(2-ethoxyethoxy)-1-ethanol  
       \*\*    in propyleneglycol
- 1)     origin : Givaudan-Roure SA, Vernier, Switzerland
- 2)     8,12-epoxy-13,14,15,16-tetranorlabdane ; origin : Firmenich SA, Geneva, Switzerland
- 10    3)     origin : International Flavours and Fragrances, USA
- 4)     origin : Firmenich SA, Geneva, Switzerland
- 5)     3-(4-ethylphenyl)-2,2-dimethylpropanal + 3-(2-ethylphenyl)-2,2-dimethylpropanal ;  
              origin : International Flavours and Fragrances, Switzerland
- 6)     2-methyl-1,3-dioxalane-2-ethylacetate ; origin : International Flavours and  
 15           Fragrances, USA
- 7)     pentadecenolide ; origin : Firmenich SA, Geneva, Switzerland
- 8)     methyl dihydrojasmonate ; origin : Firmenich SA, Geneva, Switzerland
- 9)     methyl dihydrojasmonate with high content of isomer *cis* ; origin : Firmenich SA, Geneva, Switzerland
- 20    10)    3-(1,3-benzodioxol-5-yl)-2-methylpropanal ; origin : Firmenich SA, Geneva, Switzerland
- 11)    1-(octahydro-2,3,8,8-tetramethyl-2-naphtalenyl)-1-ethanone ; origin : International Flavours and Fragrances, USA
- 12)    3-hexenyl-methyl carbonate ; origin : International Flavours and Fragrances, USA
- 25    13)    3-(4-tert-butylphenyl)-2-methylpropanal ; origin : Givaudan-Roure SA, Vernier, Switzerland
- 14)    4-(4-hydroxy-4-methylpentyl)-3-cyclohexen-1-carbaldehyde + 3-(4-hydroxy-4-methylpentyl)-3-cyclohexene-1-carbaldehyde ; origin : International Flavours and Fragrances, USA
- 30    15)    2,6-dimethyl-5-heptanal ; origin : Givaudan-Roure SA, Vernier, Switzerland
- 16)    9-decen-1-ol ; origin : International Flavours and Fragrances, USA
- 17)    2,6-di-tert-butyl-4-hydroxytoluene
- 18)    2,4-dimethyl-3-cyclohexene-1-carbaldehyde ; origin : Firmenich SA, Geneva, Switzerland

The density of each of the two phases of the composition was measured at 30° on a density meter (DMA 4500 ; Anton Paar). The density of the aqueous phase was 1.0193 and that of the oily phase was 1.0218, thus forming a stable transparent emulsion.

- 5 Moreover, the respective refractive index of each phase was also measured and the difference between the two phases was of 0.0086.

### Example 3

10 Preparation of an alcohol-free perfuming composition in the form of a water-in-oil emulsion

A water-in-oil emulsion containing the same perfuming base as that used in Example 1 has been prepared with the below-specified ingredients. Incorporation of the fluorinated  
15 oil was done after emulsification of the other ingredients by a current method in the art.

	<u>Ingredients</u>	<u>Parts by weight</u>
	Perfuming base *	10.00
	Silicon DC® 345 <sup>1)</sup>	41.20
20	Ethoxynonafluorobutane <sup>2)</sup>	16.80
	Water	17.00
	1,2-Butanediol	11.00
	Abil® Em 97 <sup>3)</sup>	<u>4.00</u>
	Total	100.00

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\* see Example 1

1) origin : Dow Corning

2) origin : 3M

3) origin : Goldschmidt

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The density of each of the two phases of the composition was measured at 30° on a density meter (DMA 4500 ; Anton Paar). The density of the aqueous phase was 1.2010 and that of the oily phase was 1.0267 thus forming a stable transparent emulsion.

Moreover, the respective refractive index of each phase was also measured and the difference between the two phases was of 0.0023.

#### Example 4

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#### Preparation of an alcohol-free perfuming composition in the form of a water-in-oil emulsion

10 A water-in-oil emulsion containing the same perfuming base as that used in Example 1 has been prepared with the below-specified ingredients. Incorporation of the fluorinated oil was done after emulsification of the other ingredients by a current method in the art.

	<u>Ingredients</u>	<u>Parts by weight</u>
	Perfuming base *	10.00
15	Silicon DC <sup>®</sup> 345 <sup>1)</sup>	42.90
	Methoxynonafluorobutane <sup>2)</sup>	15.10
	Water	16.45
	1,3-Butanediol	11.55
	Abil <sup>®</sup> Em 97 <sup>3)</sup>	<u>4.00</u>
20	Total	100.00

\* see Example 1

1) origin : Dow Corning

2) origin : 3M

25 3) origin : Goldschmidt

The density of each of the two phases of the composition was measured at 30° on a density meter (DMA 4500 ; Anton Paar). The density of the aqueous phase was 1.0201 and that of the oily phase was 1.0265, thus forming a stable transparent emulsion.

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Moreover, the respective refractive index of each phase was also measured and the difference between the two phases was of 0.0090.